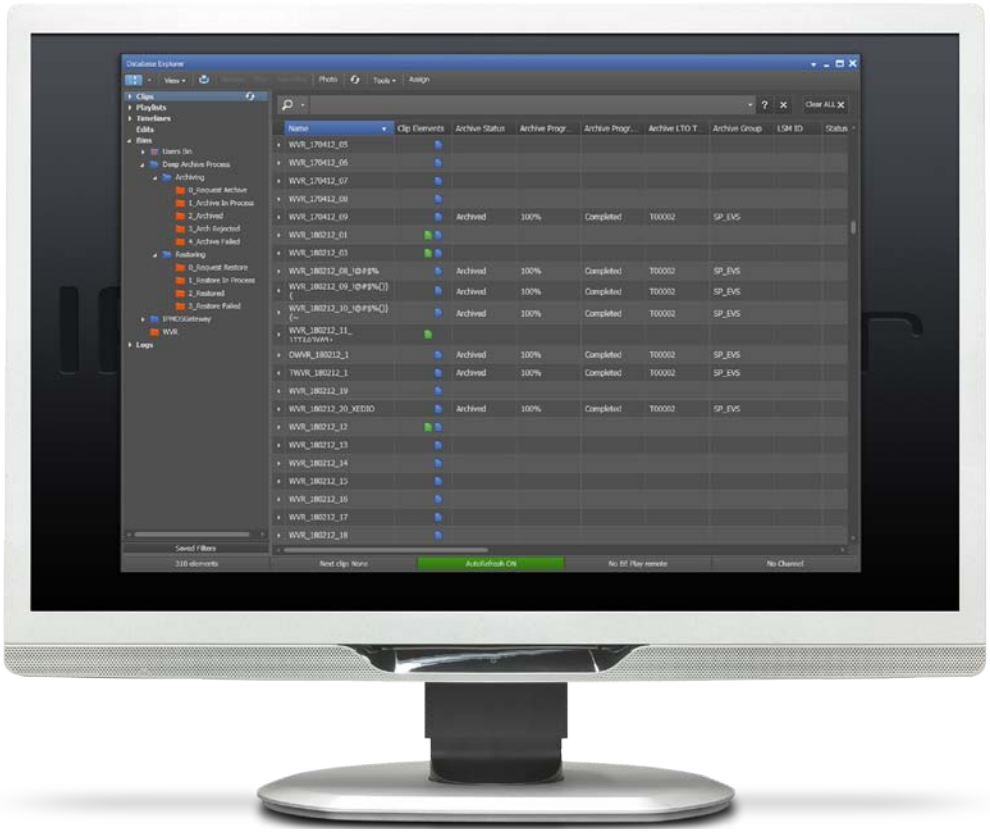
USER MANUAL
IP2Archive

Version 1.3 - July 2013



IP2Archive

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What's New

In the IP2Archive user manual the icon NEW ! has been added on the left margin to highlight information on new and updated features.

The changes linked to new features in version 1.3 are listed below.

IP2Archive now also supports SGL's FlashNet.

- See section "Overview Hardware Components" on page 3.

A new configuration tool is created to configure the IP2Archive tools: Configurator.

- See section "Configurator" on page 9.

1. Introduction

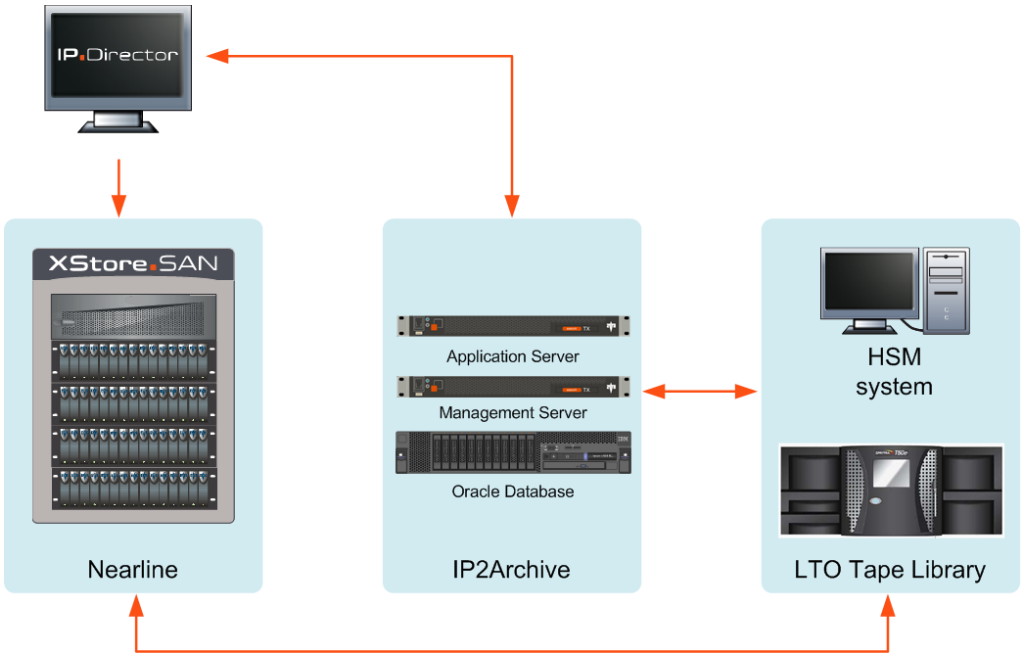
1.1. About IP2Archive

General Description

IP2Archive is an add-on for IPDirector that facilitates the connectivity between IPDirector and a third party hierarchical storage management system (HSM) and LTO tape library. It allows easy archiving and (partial) restoring of video clips and makes it possible to keep track of the archive and restore progress and status (in cache, online, offline, on tape) of each video clip.

IP2Archive Environment

The diagram below displays the interaction between IP2Archive, IPDirector and the HSM system and LTO tape library.



1.2. Requirements

1.2.1. Hardware Requirements

The following hardware requirements should be met:

- A nearline storage should be present.
- An XTAccess server containing XTAccess should be present.

1.2.2. Software Requirements

The following software requirements should be met:

- At least IPDirector 5.99.30 and 6.07.90 (API version) should be installed.
- In IPDirector XTAccess must be configured for the creation of low-resolution files.
- Remote access to the IP2Archive setup for EVS support and maintenance should be provided.

1.2.3. Workflow Requirements

The following workflow requirements should be met:

- The high- and low-resolution video files should be stored on a nearline storage.
- The low-resolution video files and their metadata XML file must be available. However, if deleted by accident, they can be restored using the Deep Archive Sync application.
- The VarID must be unique for a media asset!
- The VarID of the low-and high-resolution video file must be the same!

1.3. Hardware Setup

1.3.1. Overview Hardware Components

By default, the IP2Archive system consists of the following hardware components:

- Oracle database server
- Application server
- Managment server
- Third party network switch (Cisco)

NEW !

- Third party Hierarchical Storage Management system (HSM): DIVArchive (DIVA) from Front Porch Digital, XenData from XenData, FlashNet from SGL and Atempo Digital Archive from Atempo.
- Third party LTO tape library (Spectralogic) We support any hardware here because this should be supported by the HSM system.

The following hardware components can be added for failover and performance:

- Oracle failover database server
- Additional application servers

1.3.2. Description and Technical Specifications

Oracle Database Server

The Oracle database server has redundant power supplies and redundant memory. The system drives containing the operating system (Linux 5.4 x64) and Oracle software are configured in RAID 1 (mirror). The data drives are configured in RAID 5.

Weight	Power	BTU	# power sockets	Hardware	CPU	RAM	Hard Disk
16 kg	675 Watts	2260 BTU/h	2	IBM System X3650 M3	2x Intel Xeon E5620	24GB	2x 73GB SAS (RAID1) + 6x 300GB SAS (RAID5)

Oracle Failover Database Server

The failover database server runs Oracle Data Guard. Oracle Data Guard ensures high availability, data protection and disaster recovery and synchronizes with the main Oracle

database server. It has redundant power supplies and redundant memory. The system drives containing the operating system (Linux 5.4 x64) and Oracle software are configured in RAID 1 (mirror). The data drives are configured in RAID 5.

Weight	Power	BTU	# power sockets	Hardware	CPU	RAM	Hard Disk
16 kg	675 Watts	2260 BTU/h	2	IBM System X3650 M3	2x Intel Xeon E5620	24GB	2x 73GB SAS (RAID1) + 6x 300GB SAS (RAID5)

Application Server

The application server is the central server containing all the applications necessary to run the solution. It runs Windows 2008 R2x64. The application server runs all background applications needed for archiving and restoring. It has redundant power supply and two drives in RAID 1 (mirror). Multiple application servers can be used for performance reasons.

Weight	Power	BTU	# power sockets	Hardware	CPU	RAM	Hard Disk
11 kg	320 Watts	1093 BTU/h	2	XT Access I7 HP	2x Intel Xeon E5620	4GB	2x 250GB (RAID1)

Management Server

The management server runs Windows 7. It is the server on which the applications are running used to manage and monitor the IP2Archive system. This server must allow remote access for EVS support and maintenance purposes.

Weight	Power	BTU	# power sockets	Hardware	CPU	RAM	Hard Disk
11 kg	320 Watts	1093 BTU/h	2	XT Access I7 HP	Intel I7 950	4GB	2x 250GB (RAID1)

Cisco Catalyst Ethernet Switch

Connects the various network devices. Series: 3750-E or 3750-X.

Weight	Power	BTU	# power sockets
10 kg	212 Watts	1023 BTU/h	2

Third Party HSM System

IP2Archive can be used in combination with the following HSM systems:

- Front Porch Digital DIVArchive
- XenData Digital Archive
- SGL FlashNet
- Atempo Digital Archive

See the websites of the manufacturers for the functional and technical specifications.

Third Party LTO Tape Library

If EVS may supply the LTO tape library, then it will be a tape library by Spectralogic. If the LTO tape library is not supplied by EVS, then only the HSM software is supported. The following Spectralogic LTO tape libraries are supported:

- T50e
- T120
- T200

T50e

- Technical specifications: see www.spectralogic.com.
- Capacity and throughput

Media	Max Drives	Max Slots/Tapes	Max Capacity	Max Throughput
LTO-6	4	50	400 TB	7.5 TB/h
LTO-5	4	50	150 TB	4.0 TB/h

T120

- Technical specifications: see www.spectralogic.com.
- Capacity and throughput

Media	Max Drives	Max Slots/Tapes	Max Capacity	Max Throughput
LTO-6	10	120	960 TB	19 TB/h
LTO-5	10	120	360 TB	10.1 TB/h

T200

- Technical specifications: see www.spectralogic.com
- Capacity and throughput

Media	Max Drives	Max Slots/Tapes	Max Capacity	Max Throughput
LTO-6	8	200	1.6 PB	15.1 TB/h
LTO-5	8	200	600 TB	8.1 TB/h

1.4. Software Components

1.4.1. Overview Software Components

IP2Archive is a modular system. It consists of several software components each with a specific function, running on the application or management server connected to the IP2Archive database.

The following software components can be distinguished:

- Deep Archive Manager
- Deep Archive Sync
- Configurator
- IP2Archive Communicator
- Deep Archive Controller
- Tape Storage Controller (DIVA/ADA/FlashNet)
- File Transfer Daemon (XenData)

The Tape Storage Controller is only used when IP2Archive interfaces with the hierarchical storage management system DIVArchive by Front Porch Digital, FlashNet by SGL and Atempo Digital Archive. The File Transfer Daemon is only used when IP2Archive interfaces with Digital Archive by XenData.

1.4.2. Deep Archive Manager

The Deep Archive Manager can be considered the portal to the deep archive system. It allows librarians to manage the nearline storage by archiving and restoring clips to and from the deep archive.

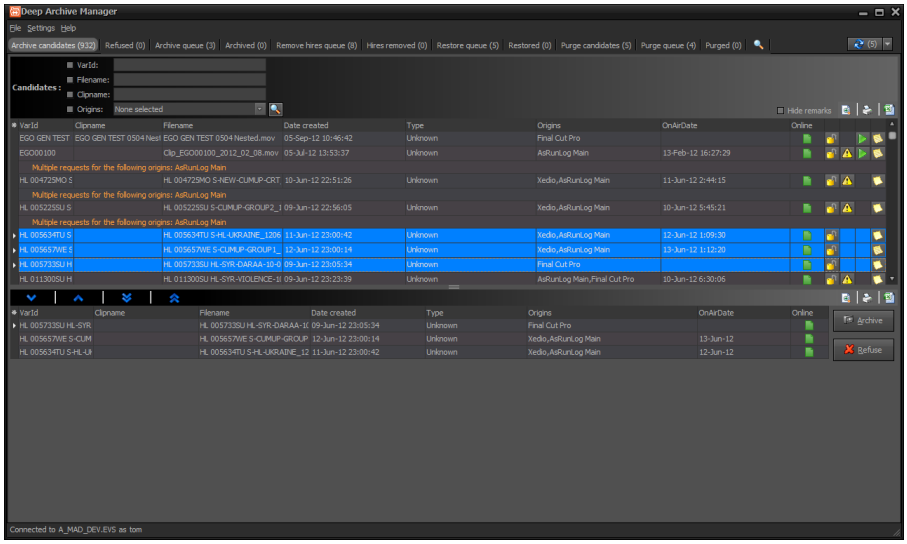
It displays the clips that have been requested in IPDirector to be archived or restored.

In the first case, the clips are displayed as archive candidates. A user can manually make a selection and accept or reject clips. The accepted clips will be archived to LTO tape, the refused clips will remain on the nearline storage. The archive process of each clip can be monitored. Once the process has been completed, the user gets an overview of all the clips that have been archived.

In the second case, the user can monitor the restore process of each clip.

Deep Archive Manager also allows the user to delete the high-resolution video file of archived clips from the nearline storage, to purge archived clips from LTO tape or to restore archived clips to the nearline storage. Again, the status and progress of each of these processes can be monitored.

Deep Archive Manager can also be configured to automatically archive, refuse and purge particular types of clips, and to remove their high-resolution video file from the nearline storage.

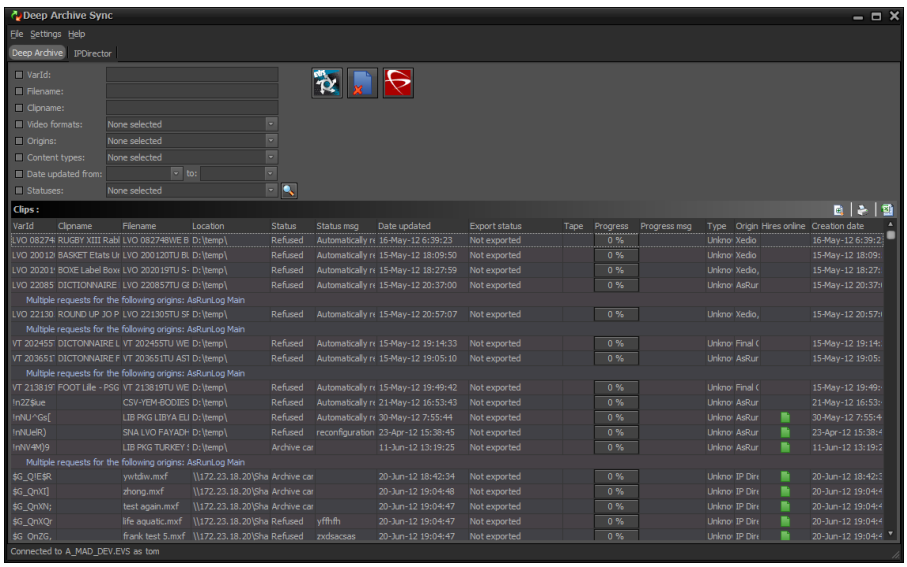

Deep Archive Manager
File Settings Help
Archive candidates (932) Refused (0) Archive queue (3) Archived (0) Remove hires queue (8) Hires removed (0) Restore queue (3) Restored (0) Purge candidates (5) Purge queue (4) Purged (0)
Candidates :
VarId:
Filename:
Clipname:
Origins:
None selected
Hide remarks
VarId Clipname Filename Date created Type Origins OnAirDate Online
EGO GEN TEST EGO GEN TEST 0504 Nest EGO GEN TEST 0504 Nested.mov 05-Sep-12 10:46:42 Unknown Final Cut Pro
EGO00100 Clip_EGO00100_2012_02_08.mov 05-Jul-12 13:53:37 Unknown AsRunLog Main 13-Feb-12 16:27:29
Multiple requests for the following origins: AsRunLog Main
HL 004725MO S HL 004725MO S-NEW-CUMUP-CRT 10-Jun-12 22:51:26 Unknown Xedio,AsRunLog Main 11-Jun-12 2:44:15
Multiple requests for the following origins: AsRunLog Main
HL 005225SU S HL 005225SU S-CUMUP-GROUP2_1 09-Jun-12 22:56:05 Unknown Xedio,AsRunLog Main 10-Jun-12 5:45:21
Multiple requests for the following origins: AsRunLog Main
HL 005634TU S HL 005634TU S-HL-UKRAINE_1206 11-Jun-12 23:00:42 Unknown Xedio,AsRunLog Main 12-Jun-12 1:09:30
HL 005657WE S HL 005657WE S-CUMUP-GROUP1_ 12-Jun-12 23:00:14 Unknown Xedio,AsRunLog Main 13-Jun-12 1:12:20
HL 005733SU H HL 005733SU HL-SYR-DARAA-10-0 09-Jun-12 23:05:34 Unknown Final Cut Pro
HL 011300SU H HL 011300SU HL-SYR-VIOLENCE-II 09-Jun-12 23:23:39 Unknown AsRunLog Main,Final Cut Pro 10-Jun-12 6:30:06
VarId Clipname Filename Date created Type Origins OnAirDate Online
HL 005733SU HL-SYR HL 005733SU HL-SYR-DARAA-1(09-Jun-12 23:05:34 Unknown Final Cut Pro
HL 005657WE S-CUM HL 005657WE S-CUMUP-GROUP 12-Jun-12 23:00:14 Unknown Xedio,AsRunLog Main 13-Jun-12
HL 005634TU S-HL-UI HL 005634TU S-HL-UKRAINE_12 11-Jun-12 23:00:42 Unknown Xedio,AsRunLog Main 12-Jun-12
Archive
Refuse
Connected to A_MAD_DEV.EVS as tom

This application is installed on the workstation of the system administrator, librarian or documentalist. See the Deep Archive Manager user manual for more information.

1.4.3. Deep Archive Sync

IP2Archive Deep Archive Sync is an application which allows an administrator to compare the archive metadata of clips in the IP2Archive database with the clip archive metadata in the IPDirector or DIVArchive database. It will highlight the differences (if any) and allow the administrator to synchronize the databases.

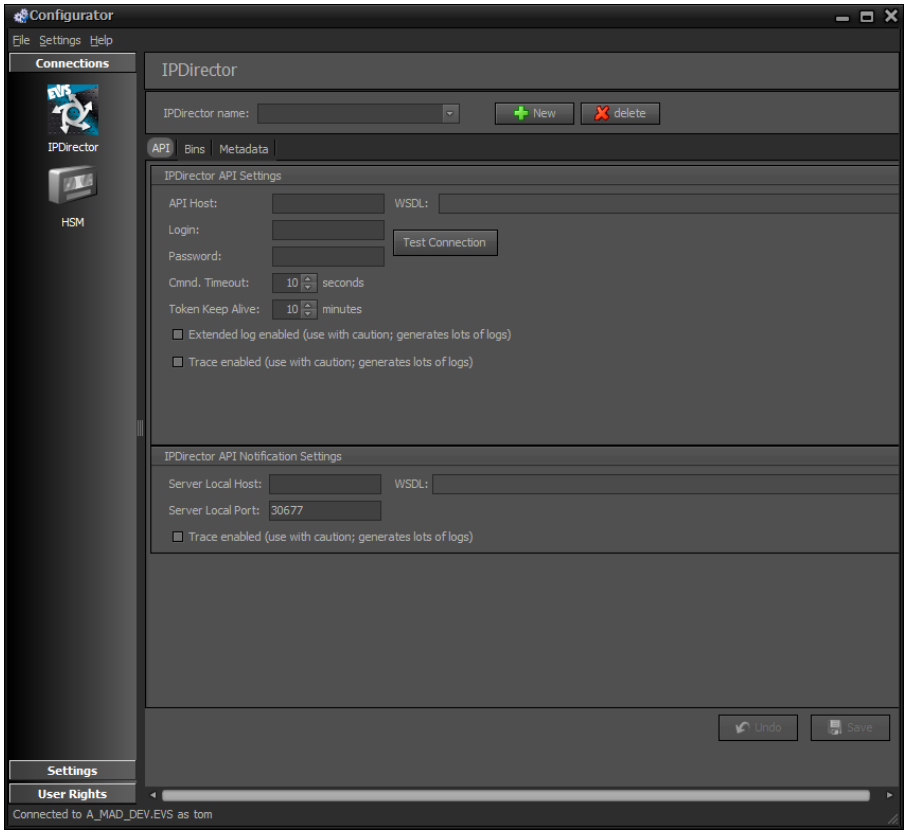
In case the IPDirector database contains clips with archive metadata that are not known in the IP2Archive database, it will allow the user to remove this archive metadata from the IPDirector database. It sometimes happens that a new clip is created starting from another clip (for example when creating a subclip). In this case, the metadata fields of the new clip will be copied from the original clip. Since the Archive Process fields are also metadata fields, they may contain incorrect data now. In particular, it happens a lot that clips are marked as 'archived' while in fact they are not.


Deep Archive Sync
File Settings Help
Deep Archive IPDirector
VarId:
Filename:
Clipname:
Video formats: None selected
Origins: None selected
Content types: None selected
Date updated from: to:
Statuses: None selected
Clips :
VarId Clipname Filename Location Status Status msg Date updated Export status Tape Progress Progress msg Type Origin Hires online Creation date
Connected to A_MAD_DEV.EVS as tom

This application is installed on the workstation of the system administrator, librarian or documentalist. See the Deep Archive Sync user manual for more information.

1.4.4. Configurator

Configurator is an application which allows a system administrator to configure the IP2Archive applications. It also allows to create users and assign them user rights.

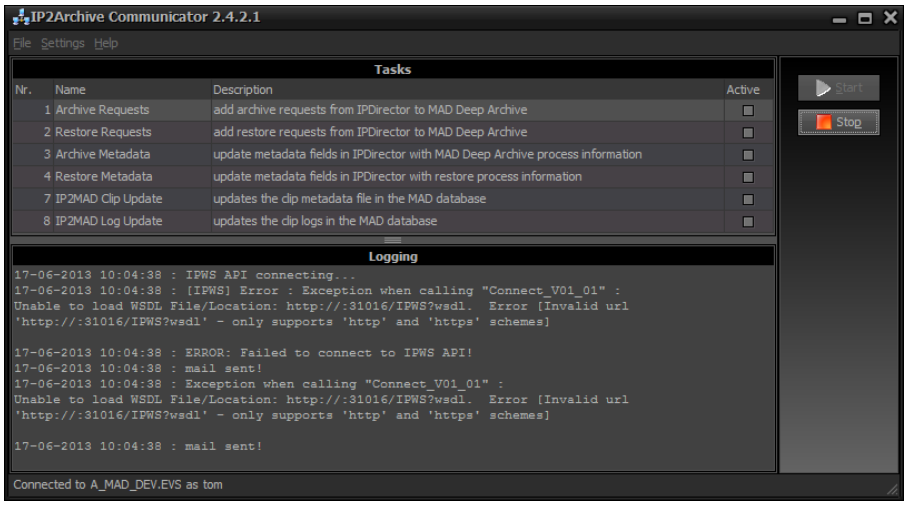


This application is installed on the workstation of the system administrator, librarian or documentalist. See the Configurator user manual for more information.

1.4.5. IP2Archive Communicator

IP2Archive Communicator is an automated application or robot that is used to interact with IPDirector using the IPDirector SOAP API. It will monitor the archive and restore process bins in IPDirector. It will enter archive and restore requests in the IP2Archive database.

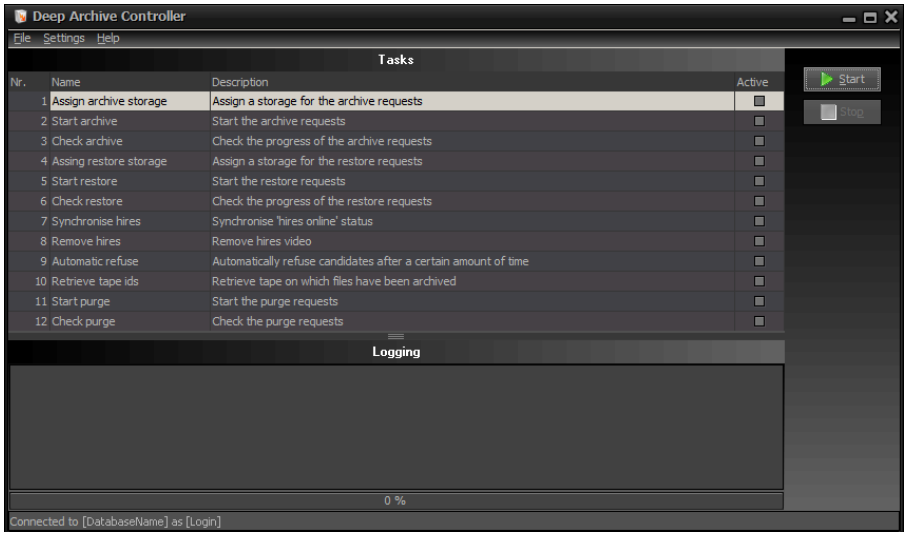
It will also update the clip archive metadata in IPDirector, for example the archive status and progress. Depending on their archive status, it will move the clips to the corresponding archive or restore process bin in IPDirector. This will allow the IPDirector users to monitor the archive or restore process of each clip.


IP2Archive Communicator 2.4.2.1
File Settings Help
Tasks
Nr. Name Description Active
1 Archive Requests add archive requests from IPDirector to MAD Deep Archive
2 Restore Requests add restore requests from IPDirector to MAD Deep Archive
3 Archive Metadata update metadata fields in IPDirector with MAD Deep Archive process information
4 Restore Metadata update metadata fields in IPDirector with restore process information
7 IP2MAD Clip Update updates the clip metadata file in the MAD database
8 IP2MAD Log Update updates the clip logs in the MAD database
Start
Stop
Logging
17-06-2013 10:04:38 : IPWS API connecting...
17-06-2013 10:04:38 : [IPWS] Error : Exception when calling "Connect_V01_01" :
Unable to load WSDL File/Location: http://:31016/IPWS?wsdl. Error [Invalid url
'http://:31016/IPWS?wsdl' - only supports 'http' and 'https' schemes]
17-06-2013 10:04:38 : ERROR: Failed to connect to IPWS API!
17-06-2013 10:04:38 : mail sent!
17-06-2013 10:04:38 : Exception when calling "Connect_V01_01" :
Unable to load WSDL File/Location: http://:31016/IPWS?wsdl. Error [Invalid url
'http://:31016/IPWS?wsdl' - only supports 'http' and 'https' schemes]
17-06-2013 10:04:38 : mail sent!
Connected to A_MAD_DEV.EVS as tom

This application is installed on the application server. See the Communicator configuration manual for more information.

1.4.6. Deep Archive Controller

Deep Archive Controller is an automated application or robot that picks up archive and restore requests. It will assign these requests to an available hierarchical storage management system and request to initiate the archive, restore and purge process. It will check the progress and status of the archive, restore and purge processes and also synchronize the status of the hi-res video files in the IPDirector database with the status in the IP2Archive database. Finally, when a user in Deep Archive Manager requests to remove a high-resolution video file from the nearline storage, Deep Archive Controller will pick up this request and command IPDirector through the IPDirector SOAP API to perform this action.

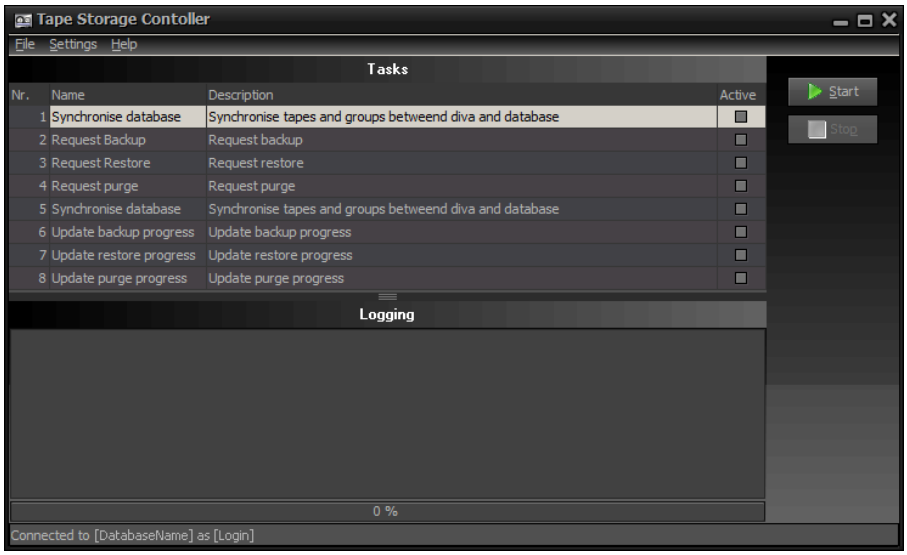

Deep Archive Controller
File Settings Help
Tasks
Nr. Name Description Active
1 Assign archive storage Assign a storage for the archive requests
2 Start archive Start the archive requests
3 Check archive Check the progress of the archive requests
4 Assing restore storage Assign a storage for the restore requests
5 Start restore Start the restore requests
6 Check restore Check the progress of the restore requests
7 Synchronise hires Synchronise 'hires online' status
8 Remove hires Remove hires video
9 Automatic refuse Automatically refuse candidates after a certain amount of time
10 Retrieve tape ids Retrieve tape on which files have been archived
11 Start purge Start the purge requests
12 Check purge Check the purge requests
Start
Stop
Logging
0 %
Connected to [DatabaseName] as [Login]

One or more instances of this application are installed on the application server. See the Deep Archive Controller configuration manual for more information.

1.4.7. Tape Storage Controller (DIVA/FlashNet/ADA)

Tape Storage Controller is an automated application or robot that interacts with the hierarchical storage management system to drive all the archive, (partial) restore and purge requests originating from the Deep Archive Controller.

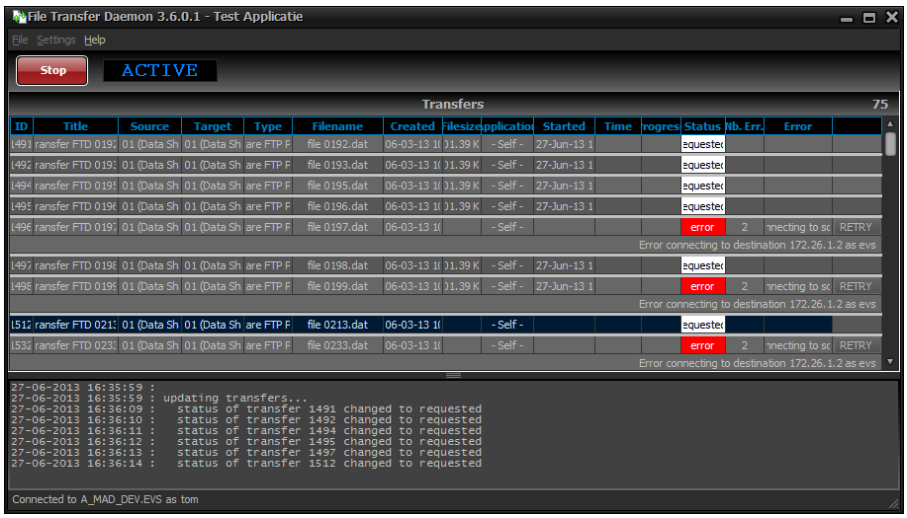
Tape Storage Controller interfaces with the following HSM systems: Atempo's Digital Archive, SGL's FlashNet, Front Porch Digital's DIVArchive.


Tape Storage Contoller
File Settings Help
Tasks
Nr. Name Description Active
1 Synchronise database Synchronise tapes and groups betweend diva and database
2 Request Backup Request backup
3 Request Restore Request restore
4 Request purge Request purge
5 Synchronise database Synchronise tapes and groups betweend diva and database
6 Update backup progress Update backup progress
7 Update restore progress Update restore progress
8 Update purge progress Update purge progress
Start
Stop
Logging
0 %
Connected to [DatabaseName] as [Login]

One or more instances of this application are installed on the application server. See the Tape Storage Controller configuration manual for more information.

1.4.8. File Transfer Daemon (XenData)

File Transfer Daemon is an automated application that transfers the files to be archived (video files, metadata XMLs, etc.) from the nearline storage to the XenData Cache where it will be picked up by the XenData archiving workflow. For restores it will check when the restoring from LTO to the Cache is finished and then transport the file back to the Nearline.

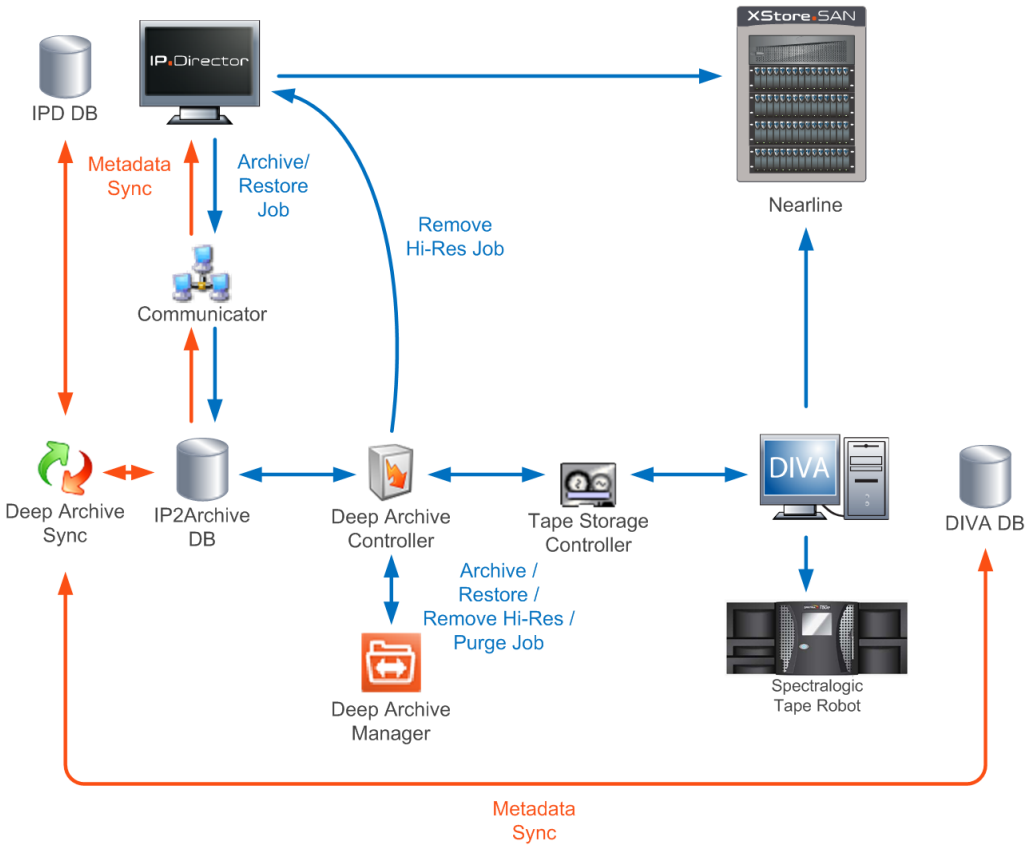

File Transfer Daemon 3.6.0.1 - Test Applicatie
File Settings Help
Stop
ACTIVE
Transfers
75
ID Title Source Target Type Filename Created Filesize Application Started Time Progress Status Nb. Err. Error
error
RETRY
Error connecting to destination 172.26.1.2 as evs
27-06-2013 16:35:59 :
27-06-2013 16:35:59 : updating transfers...
27-06-2013 16:36:09 : status of transfer 1491 changed to requested
27-06-2013 16:36:10 : status of transfer 1492 changed to requested
27-06-2013 16:36:11 : status of transfer 1494 changed to requested
27-06-2013 16:36:12 : status of transfer 1495 changed to requested
27-06-2013 16:36:13 : status of transfer 1497 changed to requested
27-06-2013 16:36:14 : status of transfer 1512 changed to requested
Connected to A_MAD_DEV.EVS as tom

This application is installed on the application server. See the File Transfer Daemon configuration manual for more information.

1.4.9. IP2Archive Software Interaction

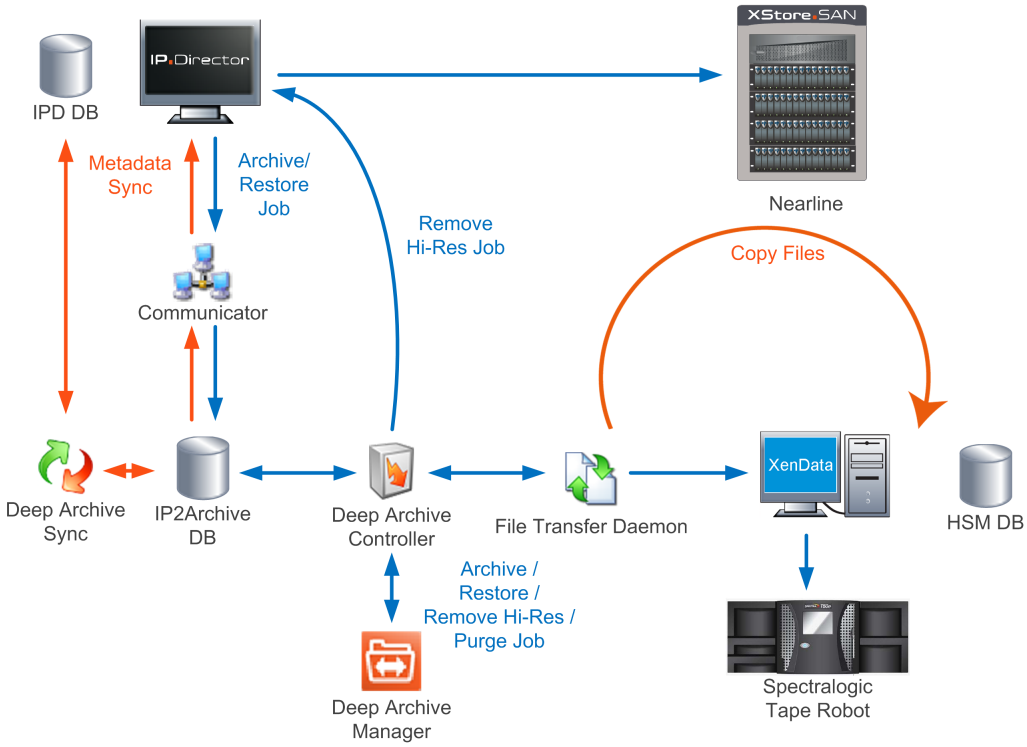
Interfacing with Front Porch Digital's DIVArchive

The following diagram shows the interactions between IPDirector and the various IP2Archive software components, and between the various IP2Archive components and FrontPorch Digital's DIVArchive.



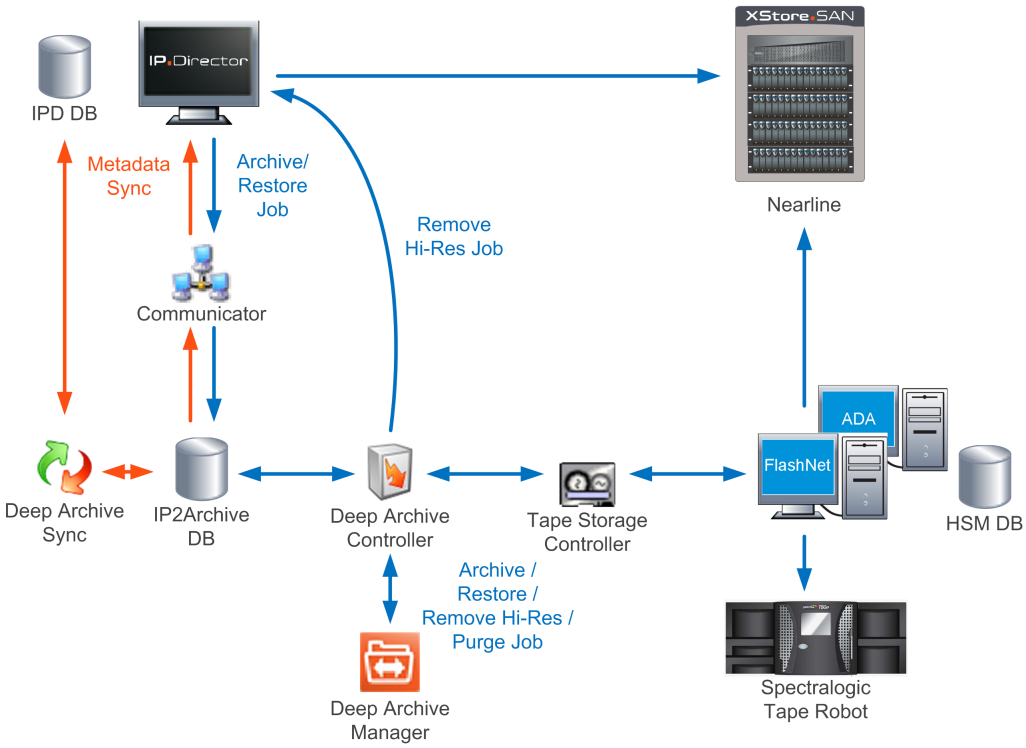
Interfacing with XenData's Digital Archive

The following diagram shows the interactions between IPDirector and the various IP2Archive software components, and between the various IP2Archive components and XenData's Digital Archive.



Interfacing with SGL's FlashNet and Atempo's Digital Archive

The following diagram shows the interactions between IPDirector and the various IP2Archive software components, and between the various IP2Archive components and SGL's FlashNet or Atempo's Digital Archive.



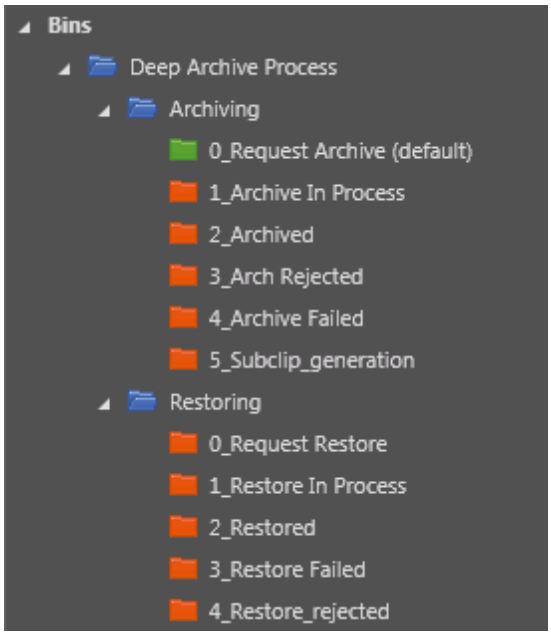
2. Archiving, Restoring and Purging Clips

2.1. Archive and Restore Bin Hierarchy

When IP2Archive is installed, an Archive and Restore bin hierarchy is created in the Database Explorer of IPDirector.

This bin hierarchy allows users to easily archive and (partially) restore clips by a simple drag-and-drop operation. It also allows them to easily keep track of the clip archive or restore status. Each bin represents namely a stage in the archive or restore process. The location of a clip in a particular bin betrays its status. When the status of a clip changes, it is moved to the bin that corresponds to its status.

In the example below 6 bins have been created for the archive process and 5 for the restore process. An additional bin has been created for generating subclips (see below).



The IP2Archive Communicator will monitor these bins, pick up the archive and restore requests and insert them in the IP2Archive database. Depending on their archive status, it will move the clips to the corresponding bin.

2.2. Archiving Clips

2.2.1. Before Archiving

Before archiving, always verify if the clips:

- have a high- and low-resolution video file that is online (= available on the nearline storage)
- have not already been archived.

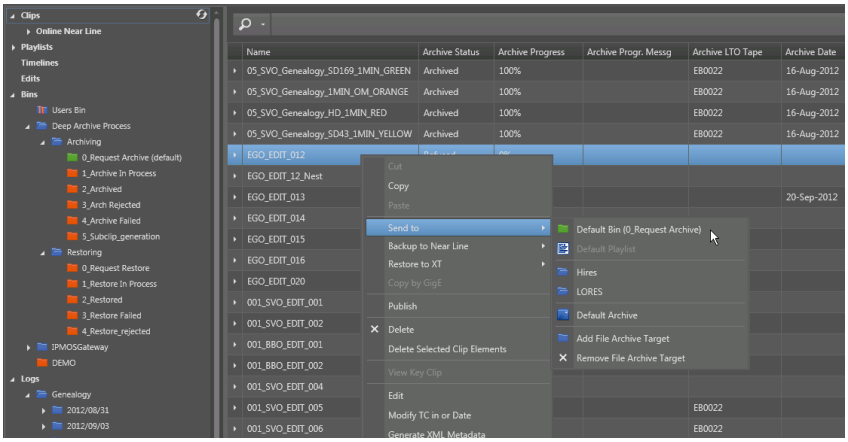
If a clip has no high- and low-resolution video file, request IPDirector to send the clip to the nearline storage first. XTAccess will then generate a high- and low-resolution video file.

2.2.2. Archiving Master Clips

The archive workflow of master clips proceeds as follows:

1. In the Database Explorer of IPDirector the user searches for the clips he wants to archive.
2. He drags and drops the clips in the **Request Archive** bin.

   If the **Request Archive** bin has been defined as the user default bin, the user can also right-click on the clip and choose **Send to > Default Bin**. See the IPDirector user manual for more information about setting a particular bin as default bin.



3. IP2Archive Communicator which continuously polls the **Request Archive** bin detects the clips and enters the archive requests in the IP2Archive database. It moves the clips to the **Archive in Progress** bin.
4. Depending on how Deep Archive Manager is configured, the clips to be archived will either appear in the Archive Candidates tab or in the Archive Queue tab of the Deep Archive Manager.

   In the first case, a librarian has to manually decide if the clips can be archived or not. If the librarian accepts the clips, the corresponding high-resolution video file and its metadata XML will be archived to LTO.

In the second case, the clip has been automatically accepted by Deep Archive Manager and will immediately appear in the Archive Queue tab.

5. Deep Archive Controller picks up the archive requests in the IP2Archive database. It checks if a HSM is available, and if this is the case, assigns the archive requests to it. It then commands Tape Storage Controller (DIVArchive, FlashNet, ADA) or File Transfer Daemon (XenData) to initiate the archive process.
6. File Transfer Daemon will copy the high-resolution files and their metadata XML from the nearline storage to the XenData Cache. Tape Storage Controller and File Transfer Daemon will request the HSM to start the archive process.
7. The high-resolution video files and their metadata XML are copied to LTO.

   During the archive process, IP2Archive Communicator provides feedback to IPDirector by updating the clip archive metadata. If anything goes wrong, the clip will be placed in the **Archive Failed** bin.
8. Once the files are successfully archived, the clips are moved to the **Archived** bin in IPDirector. In Deep Archive Manager the clips appear in the Archived tab.

2.2.3. Archiving Subclips

If you create a subclip of an existing clip in IPDirector and drag and drop this subclip in the **Request Archive** bin, this subclip will still refer to the high- and low-resolution video file of the source clip. To avoid that the original high-resolution video file gets archived, IP2Archive Communicator will copy this subclip first to the **Subclip Generation** bin. An XML job is sent to XTAccess to create a high- and low-resolution file of this subclip on the nearline storage. Once the high- and low-resolution file are created, this will be picked up by the IP2Archive Communicator and the clip will be requested for archiving.

2.2.4. Offline Files

If you try to archive a clip that has two or more high-resolution master video files, and one or more of these files are offline ( ), IP2Archive will ignore the files that are offline. These offline files will not appear in the Archive Candidates tab of the Deep Archive Manager.

If you try to archive a clip that has only high-resolution video files that are offline, the clip will immediately be moved to the **Archive Rejected** bin.

If you try to archive a subclip and the master high-resolution video file is offline, the subclip will immediately be moved to the **Archive Rejected** bin.

2.3. Removing Hires

Introduction

From within the Deep Archive Manager interface it is possible to remove the high-resolution video file of archived clips from the IPDirector nearline storage in order to free up space.

This can also be done through the IPDirector interface, but it is strongly advised to perform the removal through the Deep Archive Manager interface in order to minimize possible mistakes (i.e. accidentally removing the low-resolution video file as well).

It is also possible to automate this process.

Workflow

The removal of the high-resolution video file of archived clips from the IPDirector nearline storage proceeds as follows:

1. In the Deep Archive Manager, the user opens the Archived tab.
2. He selects the clips whose high-resolution video file he wants to delete from the IPDirector nearline storage and adds them to the selection list.
3. He clicks the **Remove Hires** button.

   The Deep Archive Controller picks up the removal request in the IP2Archive database. It commands IPDirector through the IPDirector SOAP API to remove the high-resolution video file from the IPDirector nearline storage.
4. In the Deep Archive Manager the clips are moved to the Remove Hires Queue tab.
5. Once the high-resolution video file has been removed, the clips are moved to the Hires Removed tab in Deep Archive Manager.

   IP2Archive Communicator will provide feedback to IPDirector by updating the clip archive metadata.

2.4. Restoring Clips

2.4.1. Before Restoring

Before restoring a clip, verify if the clip has been tagged as archived and only contains a low-resolution video file on the nearline storage. If you try to restore a clip the high-resolution video file of which is still online, the clip will be moved to the **Restore Rejected** bin.

2.4.2. Fully Restoring Clips

Introduction

Clips can be fully restored by dragging them into the **Request Restore** bin in IPDirector, or by selecting the clips in the Hires Removed tab of the Deep Archive Manager and by clicking the **Restore** button.

Workflow 1: Restoring Clips in IPDirector

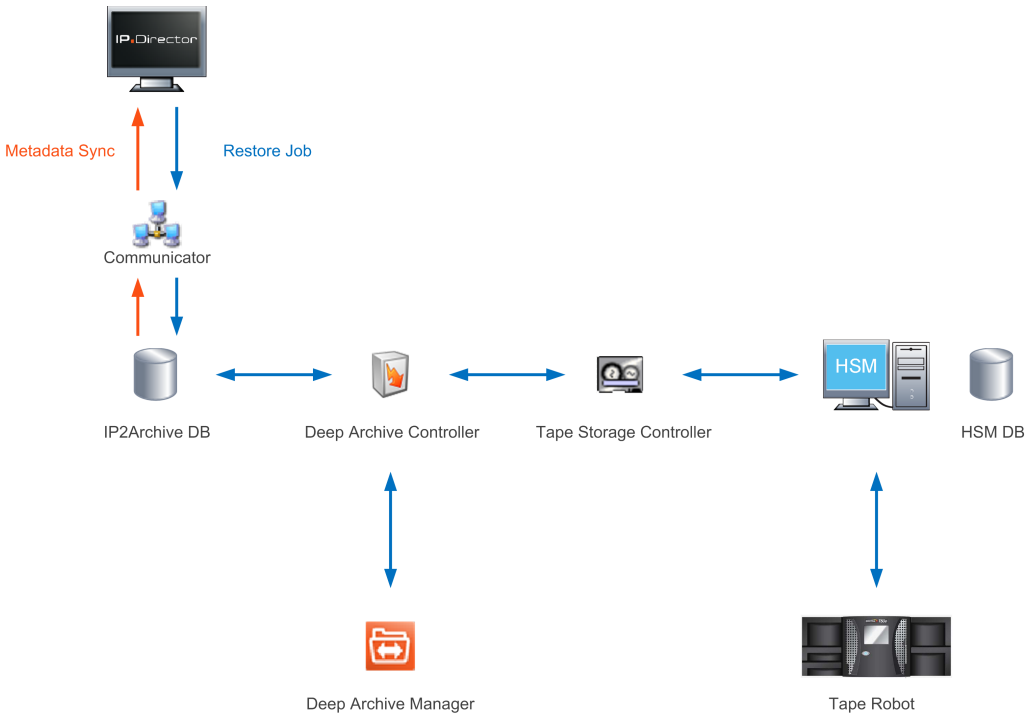
The restore workflow in IPDirector proceeds as follows:

1. In the Database Explorer of IPDirector the user searches for the clips whose high-resolution video file has to be restored to the nearline storage.
2. The user drags and drops the clips in the **Request Restore** bin.

   If the **Request Restore** bin has been defined as the user default bin, the user can also right-click the clips and choose **Send to > Default Bin**. See the IPDirector user manual for more information about setting a particular bin as default bin.
3. IP2Archive Communicator which continuously polls the **Request Restore** bin detects the clips and enters the restore requests in the IP2Archive database. It moves the clips to the **Restore in Progress** bin.
4. In the Deep Archive Manager the clip appears in the Restore Queue tab.
5. Deep Archive Controller picks up the restore requests in the IP2Archive database. It checks if a HSM is available, and if this is the case, assigns the restore requests to it. It then commands Tape Storage Controller (DIVArchive, FlashNet, ADA) or File Transfer Daemon (XenData) to initiate the restore process.
6. Tape Storage Controller and File Transfer Daemon request the HSM to start the restore process.
7. The high-resolution video files are restored from LTO tape. DIVArchive, FlashNet and ADA will restore the files directly to the nearline. XenData will restore the files to its cache. File Transfer Daemon will then transfer the files to the nearline storage.

   During the restore process, IP2Archive Communicator provides feedback to IPDirector by updating the clip archive metadata. If anything goes wrong, the clips will be placed in the **Restore Failed** bin.

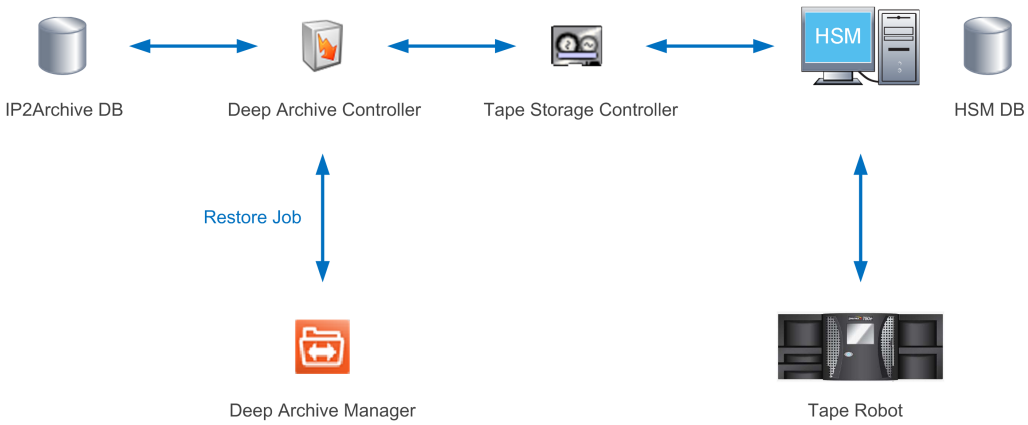
8. Once the high-resolution file of the clips are successfully restored, the clips are moved to the **Restored** bin in IPDirector. In Deep Archive Manager the clips appear in the Archived tab and also in the Restored tab.



Workflow 2: Restoring Clips in Deep Archive Manager

The restore workflow in Deep Archive Manager proceeds as follows:

1. In the Hires Removed tab of the Deep Archive Manager the librarian selects the clips to be restored and clicks the **Restore** button.
2. Deep Archive Controller picks up the restore requests in the IP2Archive database and initiates the restore process as described above.
3. The clips are moved to the Restore Queue.
4. Once the high-resolution file of the clips are successfully restored, the clips appear in the Archived and Restored tab.



2.4.3. Partially Restoring Clips

Introduction

Partially restoring clips is only possible:

- in IPDirector, not in the Deep Archive Manager
- if IP2Archive interfaces with Front Porch Digital 's DIVArchive and SGL's FlashNet
- if the low-resolution video file of the source clip is available.

Workflow

The partial restore workflow proceeds as follows:

1. In the IPDirector Database Explorer the user searches for the low-resolution video file of a clip that has been archived.
2. The user sets a new In and Out point within the boundaries of the archived clip.
3. He creates a subclip by clicking **New Clip**.

   IPDirector will give this subclip a new VarID.
4. The user drags and drops the clip in the **Request Restore** bin.
5. IP2Archive Communicator which continuously polls the **Request Restore** bin detects the clip and enters the restore requests in the IP2Archive database. It moves the clip to the **Restore in Progress** bin. In the Deep Archive Manager the clip appears in the Restore Queue tab.

   The VarID of the archived high-resolution file is retrieved from IPDirector using the full file path of the low-resolution video file the subclip was created from. It is compared with the VarID of the subclip.

   - If the VarID of this subclip already exists in DIVA or SGL, this request is handled as a “Full Restore”.
   - If the VarID does not exist, the request is handled as a “Partial Restore”.

   The TC In and TC Out of the subclip are compared with the timecodes of the archived high-resolution file.

   - If the timecodes match, this request is handled as a “Full Restore”.
   - If the timecodes fall within the timecode boundaries of the archived file, the request is handled as a “Partial Restore”. A new clip will be restored using the VarID of the subclip as the name for the restored high-resolution file: VARID.xxx, together with the metadata file : VarID.evs.xml.
6. Once the subclip has been successfully restored to the nearline storage, it will be moved to the **Restored** bin. In Deep Archive Manager the clip appears in the Restored tab.

   IPDirector will pick up the restored file in its database and link it to the low-resolution subclip previously made.

2.5. Purging Clips

Introduction

If an archived clip becomes obsolete and needs to be purged from LTO, it is possible to do this from the Deep Archive Manager interface. You can purge clips in the Archived or in the Hires removed tab.

Workflow

The purging of clips from LTO tape from within the Deep Archive Manager proceeds as follows:

1. In the Deep Archive Manager the user opens the Archived or Hires Removed tab.
2. He selects the clips he wants to purge and adds them to the selection list.
3. He clicks the **Purge** button.

   Deep Archive Controller picks up the purge request in the IP2Archive database. It commands Tape Storage Controller (ADA, FlashNet, DIVArchive) or File Transfer Daemon (XenData) to request the HSM to start the purge process.

   In the Deep Archive Manager the clips are moved to the Purge Queue tab.

   During the purge process, IP2Archive Communicator provides feedback to IPDirector by updating the clip archive metadata.
4. Once the clips have been purged from LTO tape, the clips are moved to the Purged tab.

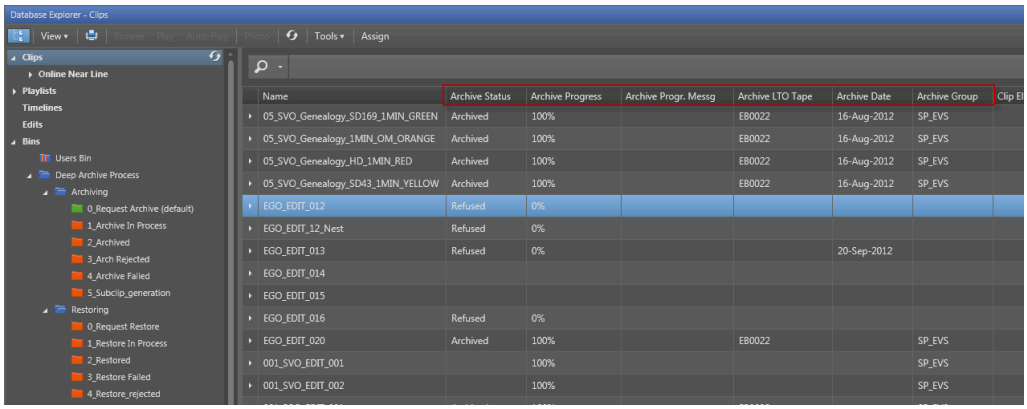
2.6. Tracking the Archive, Hires Removal, Restore and Purge Process

2.6.1. Archive Metadata

Archive metadata is added to the clips by means of specific IPDirector user fields. They will allow you to monitor their archive status.

The following user fields have been defined in IPDirector when installing IP2Archive:

- **Archive Status**
- **Archive Progress**
- **Archive Progress Message**
- **Archive LTO Tape**
- **Archive Group**
- **Archive Date**
- **Archive Status Message**



During the archive, restore, purge and hi-res removal process, IP2Archive Communicator will update these user fields with archive metadata.

2.6.2. Archive Status

A clip can have the following archive statuses:

Status	Description
Unknown	The archive status of the clip is unknown.
Request archive	A request to archive the clip has been performed in Deep Archive Manager or in IPDirector. A deep archive system has not yet been assigned.
Archive storage assigned	A deep archive system has been found ready to perform the archive request.

Status	Description
Archive candidate	The clip has been added to the Archive Candidates tab of the Deep Archive Manager.
Refused	The clip has been refused in the Archive Candidates tab of the Deep Archive Manager.
Archive requested	The request to archive the clip has been submitted to the deep archive system.
Archiving	The clip is being archived by the deep archive system.
Archived	The clip has been archived.
Archive error	An error occurred during the archive process.
Request restore	A request to restore the clip has been performed in Deep Archive Manager or in IPDirector. A deep archive system has not yet been assigned.
Restore storage assigned	A deep archive system has been found ready to perform the restore request.
Restore candidate	The clip has been added to the Hires Removed tab in the Deep Archive Manager.
Restore requested	The request to restore the clip has been submitted to the deep archive system.
Restoring	The clip is being restored.
Restore Error	An error occurred during the restore process.
Purge candidate	The clip has been automatically requested to be purged and has been added to the Purge Candidates tab.
Purge requested	A request to remove the clip from LTO tape has been performed in Deep Archive Manager. The request was issued from the Archived tab.
Purging	The high-resolution file of the clip is being removed from LTO tape.
Purged	The high-resolution file of the clip has been removed from LTO tape.
Purge error	An error occurred during the purge process.
Partially restored	The clip has been partially restored from LTO tape.
Remove hires candidate	The clip has been added to the Archived tab and its high-resolution video file is a potential candidate to be removed from LTO tape.
Request remove hires	A request to remove the high-resolution file of the clip from the nearline storage has been performed in Deep Archive Manager.
Removing hires	The high-resolution file of the clip is being removed from the nearline storage.

Status	Description
Cleanup requested	A request has been performed to remove the high-resolution file of the clip from LTO tape and from the nearline storage. The request was issued from the Purge Candidates tab.
Cleaning up	The high-resolution file of the clip is being removed from LTO tape and from the nearline storage.

The archive status is displayed in the **Archive Status** user field in IPDirector. It is automatically updated by the IP2Archive Communicator.

2.6.3. Moving Clips From Bin to Bin

IP2Archive Communicator also provides archive and restore feedback to IPDirector by placing the clips in the **Archive In Progress** or the **Restore in Progress** bin.

When the archive or restore job is finished, the clips will be moved to the final bin: **Archived** or **Restored**.

If anything goes wrong during archiving or restoring, the clips will be placed in the **Archive Failed** or **Restore Failed** bin.

A clip will be moved to the **Archive Rejected** bin if:

- it has no online high-resolution video file
- Deep Archive Manager has been configured to automatically refuse clips of this type
- a clip with the same VarID has already been archived
- ...

A (sub)clip will be moved to the **Restore Rejected** bin if:

- it does not exist in IP2Archive
- it has been purged from LTO
- the source (master) clip has not been archived yet
- ...

If you try to archive a clip that has already been archived, the clip will be moved to the **Archive Rejected** bin. If you try to restore a clip that has been purged from LTO, the clip will be moved to the **Restore Rejected** bin.

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